

Name:

Date:

MPM2D Worksheet

COMPLETING THE SQUARE

(A method of converting to **vertex** form)

Convert the following quadratic equations to vertex form:

- a) $y = x^2 - 12x + 13$
- b) $y = x^2 - 60x - 21$
- c) $y = 3x^2 + 12x - 5$
- d) $y = x^2 + 15x + \frac{1}{2}$
- e) $y = -2x^2 + 8x + 3$
- f) $y = \frac{1}{2}x^2 + 10x - 8$
- g) $y = 3x^2 - 24x + 1$
- h) $y = x^2 - 36x$
- i) $y = 2x^2 + 7$
- j) $y = -6x^2 + 12x - \frac{1}{2}$
- k) $y = x^2 - 3x + 8$
- l) $y = 3x^2 - 15x - 29$
- m) $y = -8x^2 - 64x$
- n) *** $y = -\frac{8}{7}x^2 - \frac{2}{3}x - 3$

For questions e, j and l complete the following:

1. the equation in vertex form
2. the vertex
3. the equation of the axis of symmetry
4. the maximum or minimum value and when it occurs
5. the number of x intercepts
6. two points on the parabola and x and y-intercepts

ANSWERS:

- a) $y = (x - 6)^2 - 23$
- b) $y = (x - 30)^2 - 921$
- c) $y = 3(x - 2)^2 - 17$
- d) $y = \left(x + \frac{15}{2}\right)^2 - 55.75$
- e) $y = -2(x - 2)^2 + 11$
- f) $y = \frac{1}{2}(x + 10)^2 - 58$
- g) $y = 3(x - 4)^2 - 47$
- h) $y = (x - 18)^2 + 324$
- i) $y = 2x^2 + 7$
- j) $y = -6(x - 1)^2 + 5.5$
- k) $y = \left(x - \frac{3}{2}\right)^2 + 5.75$
- l) $y = 3\left(x - \frac{5}{2}\right)^2 - 18.75$
- m) $y = -8(x + 4)^2 + 128$
- n) $y = -\frac{8}{7}\left(x + \frac{7}{24}\right)^2 - \frac{209}{72}$